

and therefore a space required for the inverting movement of the pickup means can be small, and also the drive means for driving the lightweight carriage can be of the small type. In these respects, also, the overall construction of the disc player can easily be made compact.

Another example of a pickup reversing mechanism for double-sided playing disc player according to the present invention will now be described with reference to FIGS. 18 to 21, in which the same reference numeral as the mechanism shown in FIGS. 15 to 17 are used to indicate the like components or members.

The outer end of each of the first and second guide members 208 and 209 is pointed, and the carriage 213 can be attached to and detached from each of the guide members 208 and 209 through this pointed end. A support pin 324 is provided for engagement with the carriage 213, detached from each of the guide members 208 and 209, instead of the guide members so as to support it. The support pin 324 is secured to a disc-shaped rotary member 325 through a boss 326, and is rotatable and axially slidable with respect to the rotary member 325. The rotary member 325 is rotatably supported by a support shaft 328 secured to an internal sun gear 327 disposed in concentric relation to the rotary member. The rotary members 325 is so arranged as to rotate along a plane intersecting the direction of guiding of the carriage 213 by the first and second guide members 208 and 209, and in this case, along a plane perpendicular thereto. A planetary gear 329 is in mesh with the sun gear 326. The rotary member 325 has a retainer member 330 projecting therefrom and disposed in sliding contact with the planetary gear 329 for preventing it from being displaced in its axial direction.

A coil spring 332 is fitted on a rear portion of the support pin 324 which serves to support the carriage 213 disengaged from the first and second guide members. One end of the coil spring 332 is fixedly secured to the support pin 324 while the other end is engaged with a pin 329a projecting from the planetary gear 329 adjacent to an outer periphery thereof. A flange 324a for engagement with the carriage 213 to position the carriage is formed on the support pin 324.

As shown in FIG. 20, a projecting portion 325b is formed on the rotary member 325 and extends toward the rail 222 (or 221), and the roller 217 disengaged from the rail 222 rides on a tapered surface 325c of the projecting portion 325b and then is received in an arcuate recess 325d formed rearwardly of this tapered surface. With this arrangement, the carriage 213 is positioned with respect to the support pin 324 and the rotary member 325, and it will not be disengaged from the support pin 324 unless a force of more than a predetermined value is applied. In order that the roller 217 can move from the rail 222 (or 221) onto the tapered surface 325c of the projecting portion 325b, the carriage 213 need be rotated about the first guide member 208 or the second guide member 209, and this rotation (in the directions of the arrow R) can be achieved because, as described above, the notch 213a is formed in the carriage 213 at the portion thereof where the carriage engages with each of the two guide members. A holder member for holding the carriage 213 is constituted by the projecting portion 325b, including the tapered surface 325c and the arcuate recess 325d, and the support pin 324.

As shown in FIG. 21, the support pin 324 for supporting the carriage 213 has two spiral grooves 324c and 324d of the same pitch formed in its outer peripheral

surface and spaced axially from each other. An annular groove 324e is also formed in continuous relation to the rear spiral groove 324d. Semi-spherical projections 326b and 329b are formed respectively on the boss 326 and at the center hole of the planetary gear 329, the support pin 324 being slidably engaged with this boss and this central hole. One projection 326b is disposed in sliding contact with the spiral groove 324c while the other projection 329b is disposed in sliding contact with the spiral groove 324d and the annular groove 324e.

A torque transmitting mechanism for transmitting a torque to the rotary member 325 is constituted by the sun gear 327 and the planetary gear 329. The torque transmitting mechanism, the rotary member 325 and the support shaft 328 constitute an inverting mechanism for moving the holder member (mentioned above), which includes the support pin 324, in an inverted manner from one of the attachment/detachment positions of the first and second guide members to the other along a plane intersecting the direction of guiding by each of the two guide members. And, a drive means for driving the inverting mechanism to move the holder member, which includes the support pin 324, in an inverted manner is constituted by the shaft 214, the motor 215, the gear 216 and the roller 217 which are mounted on the carriage 213, the rack members 218, 219, the rails 221, 222, the coil spring 332, and the spiral grooves 324c, 324d and the annular groove 324e which are formed in the support pin 324.

Next, the operation of the double-sided playing disc player will be described briefly.

As shown in FIG. 18, when the playing of the lower recording surface of the disc 201 is finished, the carriage 213 is further moved outwardly, so that it is disengaged from the second guide member 209 and is fitted on the support pin 324 and is engaged with the flange 324a. Then, the motor 215 is rotated, and the carriage 213 is further moved outwardly, so that the support pin 324 is slidably moved in this direction (direction of an arrow S). As a result, the support pin 324 is rotated through the one spiral groove 324c formed in the support pin 324 and the semi-spherical projection 326b formed on the boss 326 and slidably engaged in that spiral groove. On the other hand, the projection 329b of the planetary gear 329 formed at its center hole is slidably engaged in the other spiral groove 324d having the same pitch as the spiral groove 324c. Therefore, even if the support pin 324 is rotated, the planetary gear does not rotate. Therefore, in accordance with the rotation of the support pin 324, the coil spring 332 is yielded to store energy.

When the support pin 324 is rotated through a predetermined angle, the projection 329b of the planetary gear is disengaged from the spiral groove 324d and is received in the annular groove 324e. As a result, the coil spring 332 is released from its yielded condition, so that the planetary gear 329 instantaneously revolves on the sun gear 327 under the restoring force of the coil spring 332. Since the support pin 324 is engaged with the rotary member 325 together with the planetary gear 329, the rotary member 325 is rotated through 180 degrees in accordance with the revolution of the planetary gear 329. Therefore, the carriage 313 carrying the optical pickup means is moved in an inverted manner so as to correspond to the upper recording surface of the disc 201. Then the disc is driven for rotation in a direction opposite to the direction at the time of playing of the